CLOUD AEROSOL INTERACTIONS

What are the major issues?

1. What do we need to know about aerosol composition in order to adequately predict the number of aerosol particles that will be activated to form cloud droplets at a given supersaturation? Is specifying the size distribution or the composition more important?

2. What role does aerosol loading and/or composition have on properties of the droplet size distribution beyond the number concentration.

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3. Does cloud processing play a significant role in determining aerosol composition and physical properties. Is there anything beyond H_2O_2/SO_2 chemistry, N_2O_5 chemistry, and the partitioning of soluble gases?

4. What chemical and physical properties make a good ice condensation nucleus?

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5. What do we need to do to get better estimates of the second indirect aerosol effect.

   Progress has been made, but additional work needs to be done (e.g., incorporating the effects of turbulence and the dispersion of the droplet size distribution into parameterizations of the rate of drizzle formation). Simple parameterizations need to developed for the drizzle rate. Parameterizations need to be evaluated over a broad range of conditions.

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Field Studies needed-

Cloud studies in a region that is truly remote to get baseline cloud microphysical data for comparison to data collected in more anthropogenically influenced regions.

Continued studies of the relations between aerosol composition, size and CCN activity. Need to sample regions with characteristically different aerosol composition to address similarities and differences in behavior.